CLAIMS

1.   A method for determining a data rate for a data transmission over a communication channel in a wireless communication system, comprising:

identifying a set of parameters for the data transmission;

estimating one or more characteristics of the communication channel;

deriving a metric for an equivalent channel based on the set of parameters and the one or more estimated channel characteristics;

determining a threshold signal quality required for the equivalent channel to support a particular data rate; and

indicating whether or not the particular data rate is supported by the communication channel based on the metric and the threshold signal quality.

2.   The method of claim 1, wherein the set of parameters includes a particular coding scheme and a particular modulation scheme to be used for the data transmission.

3.   The method of claim 2, wherein the one or more estimated channel characteristics include an estimated frequency response of the communication channel and an estimated noise variance of the communication channel.

4.   The method of claim 1, wherein the equivalent channel has a flat frequency response across a system bandwidth.

5.   The method of claim 2, wherein the deriving the metric includes

determining an equivalent data rate for the equivalent channel based on a first function, the set of parameters, and the one or more estimated channel characteristics, and

wherein the metric is derived based on a second function, the equivalent data rate, and the particular modulation scheme.

6.   The method of claim 5, wherein the first function is a constrained channel capacity function.

7.   The method of claim 5, wherein the second function is an inverse of the

2   first function.

8.   The method of claim 1, wherein the signal quality is quantified by a

2   signal-to-noise-and-interference ratio (SNR).

9.   The method of claim 8, wherein the deriving the metric includes

2   estimating a post-detection SNR for the communication channel based on a

particular equalizer, and wherein the estimated signal quality for the equivalent channel

4   is the estimated post-detection SNR.

10.   The method of claim 2, wherein a single modulation scheme is used for

2   all frequency subchannels used for the data transmission.

11.   The method of claim 2, wherein a plurality of modulation schemes are

2   used for a plurality of frequency subchannels used for the data transmission.

12.   The method of claim 1, wherein the wireless communication system is an

2   orthogonal frequency division multiplex (OFDM) system.

13.   A method for determining a rate for a data transmission over a

2   communication channel in an orthogonal frequency division multiplex (OFDM) system,

comprising:

4   identifying a set of parameters for a particular rate and indicative of a particular

data rate, a particular modulation scheme, and a particular coding scheme;

6   estimating and one or more characteristics of the communication channel;

deriving an equivalent data rate based on a first function, the set of parameters,

8   and the one or more estimated channel characteristics;

deriving a metric for the equivalent channel based on a second function, the

10 equivalent data rate, and the particular modulation scheme;

determining a threshold signal-to-noise-and-interference ratio (SNR) required

12 for the equivalent channel to support the particular data rate with the particular

modulation and coding schemes; and

14   indicating the particular rate as being supported by the communication channel

if the metric is greater than or equal to the threshold SNR.

14.   The method of claim 13, wherein the first function is a constrained

2   channel capacity function.

15.   The method of claim 13, wherein the first function is the Shannon

2   channel capacity function.

16.   The method of claim 13, wherein the particular rate is selected from

2   among a set of available rates, and wherein each of one or more available rates is

evaluated to determine a highest data rate supported by the communication channel.

17.   The method of claim 13, wherein the deriving the equivalent data rate

2   and the deriving the metric are both achieved by estimating a post-detection SNR for the

communication channel after equalization by a particular equalizer.

18.   The method of claim 17, wherein the particular equalizer is a minimum

2   mean square error linear equalizer (MMSE-LE) or a decision feedback equalizer (DFE).

19.   A method for transmitting data over a communication channel in an

2   orthogonal frequency division multiplex (OFDM) system, comprising:

identifying an initial rate to be used for a data transmission over the

4   communication channel;

processing data for transmission over the communication channel based on the

6   initial rate;

transmitting a first portion of the processed data;

8   receiving an indication of incorrect reception of the data transmission; and

transmitting an additional portion of the processed data.

20.   The method of claim 19, wherein the initial rate is determined based on

2   an estimated signal-to-noise-and-interference ratio (SNR) for an equivalent channel.

21.   The method of claim 19, wherein the initial rate is indicative of a particular data rate, a particular modulation scheme, and a particular coding scheme to be used for the data transmission.

22.   The method of claim 21, wherein the processing includes

coding the data in accordance with the particular coding scheme;

puncturing the coded data in accordance with a particular puncturing scheme; and

modulating unpunctured coded data in accordance with the particular modulation scheme.

23.   The method of claim 22, wherein the first portion comprises the unpunctured coded data and the additional portion comprises the coded data previously punctured and not yet transmitted.

24.   The method of claim 19, further comprising:

repeating the transmission of an additional portion, one or more times, until an indication of correct reception of the data transmission is received.

25.   The method of claim 19, wherein each additional portion to be transmitted in response to receiving the indication of incorrect reception comprises processed data not transmitted previously.

26.   A receiver unit in a wireless communication system, comprising:

a channel estimator operative to derive estimates of one or more characteristics of a communication channel used for a data transmission; and

a rate selector operative to receive channel estimates from the channel estimator and a set of parameters indicative of a particular rate for the data transmission, derive a metric for an equivalent channel, determine a threshold signal quality required for the equivalent channel to support the particular rate, and indicate whether or not the particular rate is supported by the communication channel based on the metric and the threshold signal quality.

27. The receiver unit of claim 26, further comprising:

2   a decoder operative to provide a status of each received transmission for a particular packet of data; and

4   a controller operative to provide feedback information comprised of the particular rate and an indication of the packet status.

28. The receiver unit of claim 26, wherein the rate selector is further

2 operative to determine an equivalent data rate for the equivalent channel based on a first function, the set of parameters, and the channel estimates, and to derive the metric for

4 the equivalent channel based on a second function, the equivalent data rate, and a particular modulation scheme associated with the particular rate.

29. The receiver unit of claim 28, wherein the first function is a constrained

2 channel capacity function.

30. The receiver unit of claim 28, further comprising:

2   a memory configured to store one or more tables for the first function.

31. A receiver apparatus in a wireless communication system, comprising:

2   means for deriving estimates of one or more characteristics of a communication channel used for a data transmission;

4   means for deriving a metric for an equivalent channel based on the channel estimates and a set of parameters indicative of a particular rate for the data transmission;

6   means for determining a threshold signal quality required for the equivalent channel to support the particular rate; and

8   means for indicating whether or not the particular rate is supported by the communication channel based on the metric and the threshold signal quality.

32. The receiver apparatus of claim 31, further comprising:

2   means for determining an equivalent data rate for the equivalent channel based on a first function, the set of parameters, and the channel estimates, and

4   wherein the metric is derived based on a second function, the equivalent data rate, and a particular modulation scheme associated with the particular rate.

33.   The receiver apparatus of claim 32, further comprising:

2   means for storing one or more tables for the first function.

34.   A transmitter unit in an orthogonal frequency division multiplex

2   (OFDM) system, comprising:

a controller operative to identify an initial rate to be used for a data transmission

4   over a communication channel and to receive an indication of correct or incorrect

reception of the data transmission, wherein the initial rate is indicative of a particular

6   data rate, a particular modulation scheme, and a particular coding scheme to be used for

the data transmission;

8   a transmit data processor operative to code data in accordance with the particular

coding scheme;

10   a modulator operative to modulate a first portion of the coded data in accordance

with the particular modulation scheme, and to further modulate an additional portion of

12   the coded data if the indication of incorrect reception of the data transmission is

received; and

14   a transmitter operative to transmit the modulated data.

35.   The transmitter unit of claim 34, wherein the transmit data processor is

2   further operative to puncture the coded data in accordance with a particular puncturing

scheme, and wherein the first portion comprises the unpunctured coded data and the

4   additional portion comprises the coded data previously punctured and not yet

transmitted.

36.   A transmitter apparatus in a wireless communication system, comprising:

2   means for identifying an initial rate to be used for a data transmission over a

communication channel, wherein the initial rate is indicative of a particular data rate, a

4   particular modulation scheme, and a particular coding scheme to be used for the data

transmission

6   means for coding data in accordance with the particular coding scheme;

means for modulating a first portion of the coded data in accordance with the

8   particular modulation scheme;

means for receiving an indication of correct or incorrect reception of the data

10   transmission at a receiver;

means for modulating an additional portion of the coded data if the indication of

12   incorrect reception of the data transmission is received; and

means for transmitting the modulated data.